

No. 683,026.

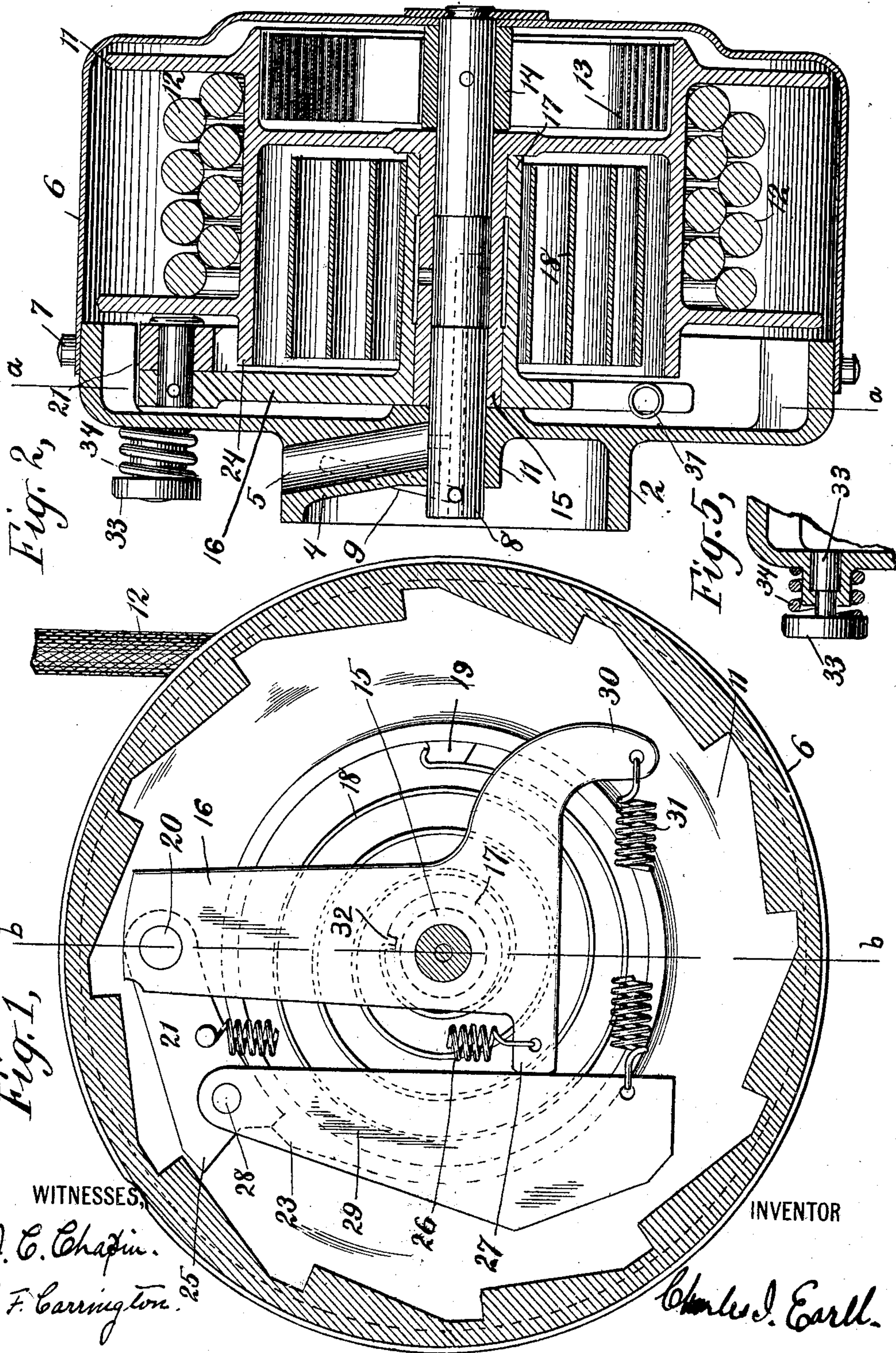
Patented Sept. 24, 1901.

C. I. EARLL.  
TROLLEY CATCHER.

(Application filed Feb. 28, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES,

J. C. Chapin.

C. F. Carrington.

INVENTOR

Charles I. Earll.



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Fig. 4,

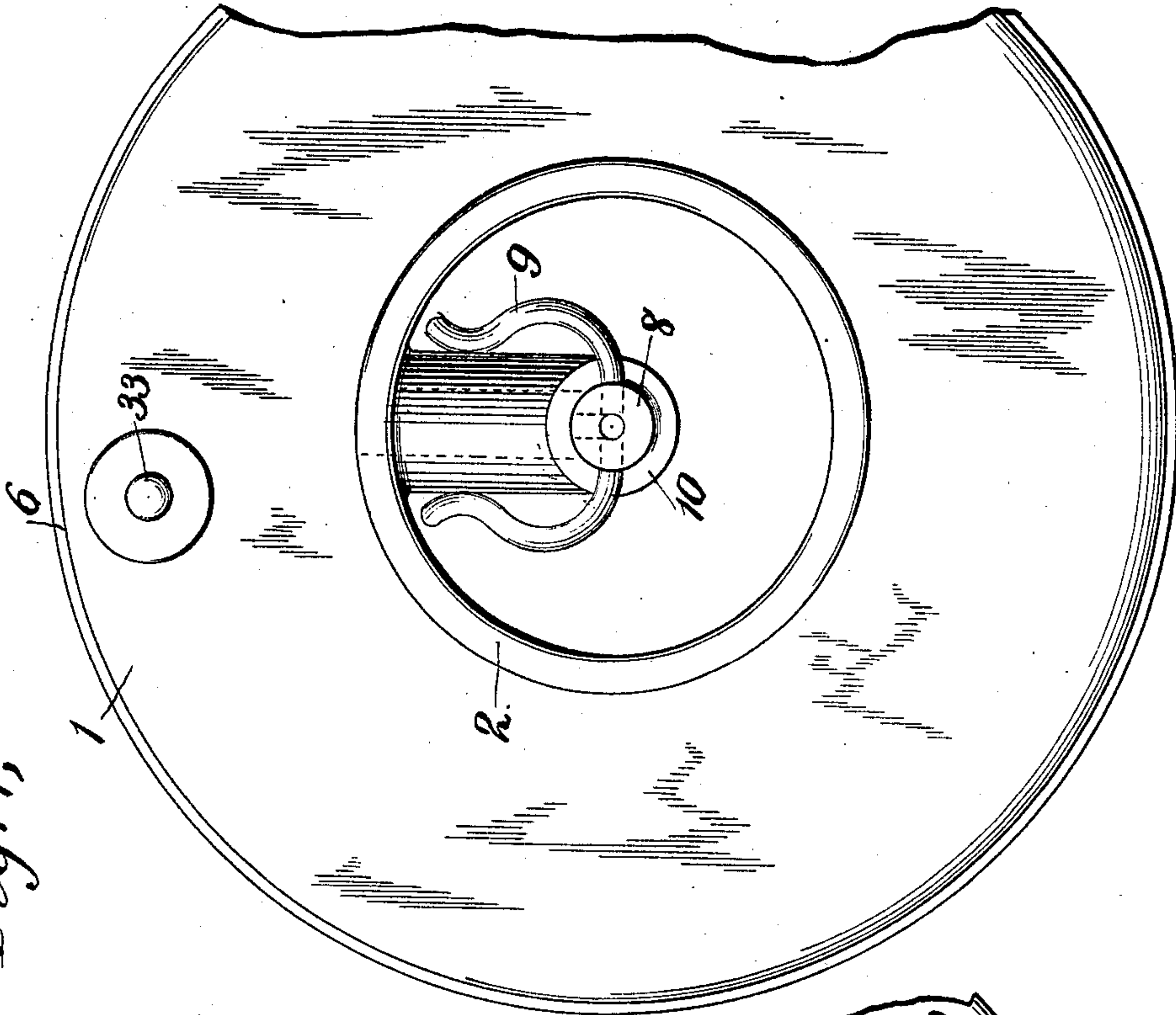
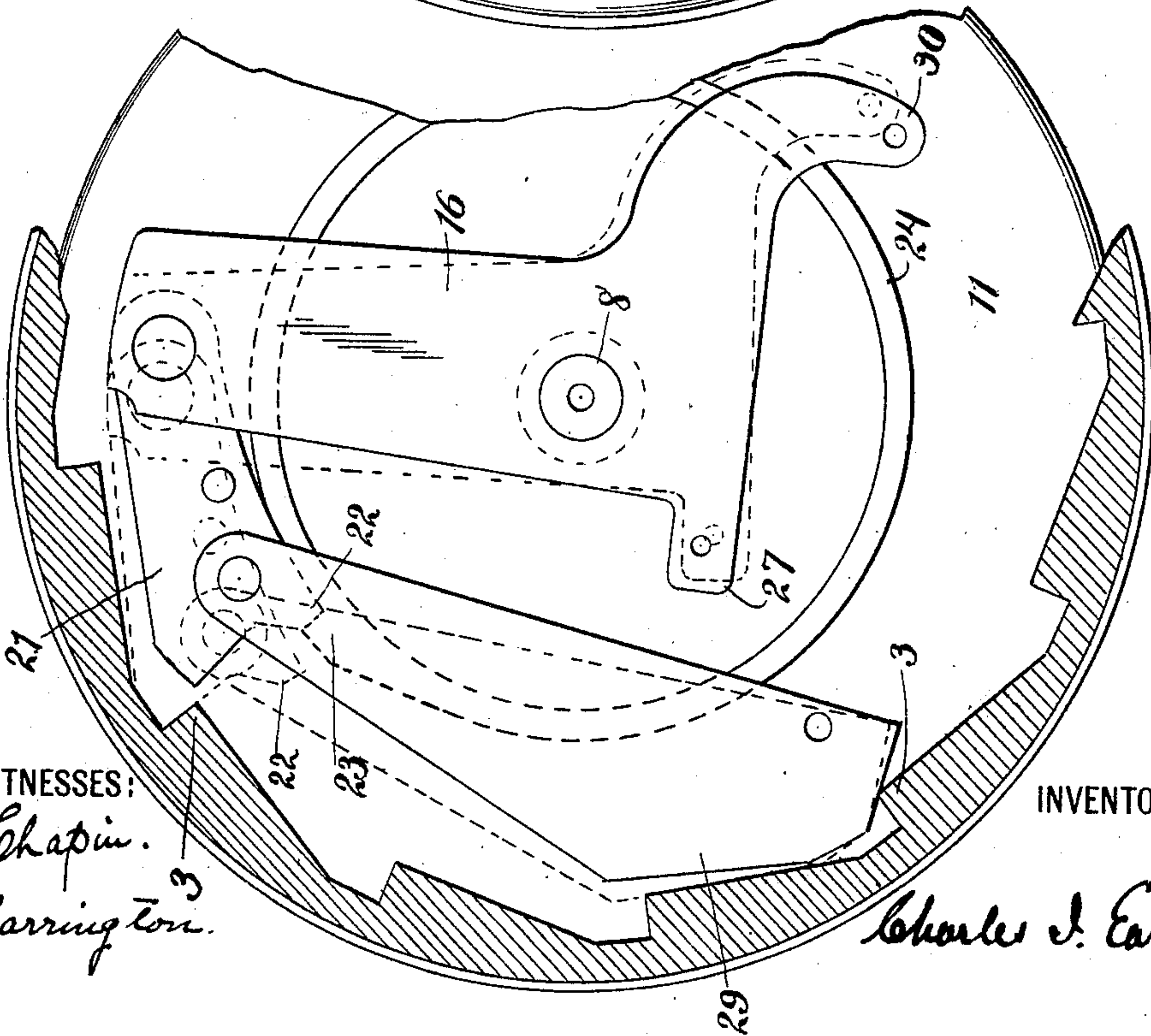


Fig. 3,



WITNESSES:

J. C. Chapin.  
C. F. Carrington.

INVENTOR

Charles J. Earll



# UNITED STATES PATENT OFFICE.

CHARLES I. EARLL, OF NEW YORK, N. Y.

## TROLLEY-CATCHER.

SPECIFICATION forming part of Letters Patent No. 683,026, dated September 24, 1901.

Application filed February 26, 1901. Serial No. 48,944. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES I. EARLL, a citizen of the United States of America, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Trolley-Catchers, of which the following is a specification.

My invention relates to trolley-catchers for electric cars which use the overhead trolley, and has for its object to produce a device of this class which shall automatically take up the slack in the trolley-rope due to the varying distance of the trolley-wire from the car and automatically pull down the trolley-pole when from any cause it has left the wire.

My invention consists in providing a sheave or drum to which the end of the trolley-rope is attached, in attaching a relatively weak spring to said drum, which acts to take up slack in the trolley-rope, in attaching a relatively strong spring to said drum, which is normally held in a strained condition, but inoperative, to effect rotation of said drum, in providing means for automatically putting said heavy spring into operation when the trolley leaves the wire, and in other novel features and constructions, to be hereinafter more fully explained.

In the drawings accompanying and forming part of this specification, Figure 1 is a transverse section on line *a a* of Fig. 2. Fig. 2 is a section on line *b b* of Fig. 1. Fig. 3 is a partial section corresponding to Fig. 1, showing different operative positions for the parts. Fig. 4 is a partial end view. Fig. 5 is a partial cross-section through the center of the bolt 33.

Reference characters are used in the same sense in all of the figures and the specification.

Numeral 1 represents a stationary support which is adapted to be secured to the dash of the car in any convenient manner.

2 represents a cylindrical projection made integrally with the support 1, which is adapted to be received in a corresponding socket (not shown) secured to the end of the car or in any other convenient manner.

3 represents internal ratchet-teeth formed in the support 1. 4 represents a rib on the back of said support. 5 is an oil-hole in said rib.

6 represents a case, preferably made of sheet metal, which, with the support 1, incloses the mechanism of the trolley-catcher, the said case 6 being secured to the support 1 in any convenient manner, as by the screws 7.

8 represents a shaft journaled in the support 1 and in the case 6. The shaft 8 projects through the central hub 10 of the support 1 and receives the spring-key 9, which is adapted to turn up and engage the rib 4 to prevent the said shaft from turning. Mounted on the shaft 8 is the drum 11, on which is wound the trolley-rope 12, the other end of the trolley-rope being secured to the trolley-pole near its end in the usual manner.

13 represents a light spiral spring secured at its outer end to the drum 11 and at its inner end to the sleeve 14, the said sleeve 14 being itself secured to the shaft 8. This spring acts to wind up the trolley-rope 12 with a slight tension, preferably just sufficient to take up the slack in said trolley-rope.

The drum 11 is provided with the elongated hub or sleeve 15, which fits freely on the shaft 8. Mounted on the sleeve 15 is the rotatable member or lever 16, which is provided with the elongated hub or sleeve 17, the said sleeve 17 fitting freely over the sleeve 15 of the drum.

18 represents a relatively stiff spiral spring located within the drum 11, having its outer end engaging the lug 19 on said drum and its inner end engaging the groove 32 of the sleeve 17 of the lever 16, so that when the spring 18 is under strain or wound up and the lever 16 is held against rotation the spring 18 tends to rotate the drum in a direction to wind up the trolley-rope 12. The lever 16 is provided with the pin 20, which carries the clutch or pawl 21. The said pawl 21 is provided with the inner point 22, adapted to engage the tooth 23 on the flange 24 of the drum 11. The pawl 21 is provided with the point 25, which as said pawl is thrown out of engagement with the tooth 23 engages a tooth 3 of the support 1.

26 represents a spring secured at one end to the lug 27 of the lever 16 and at the other end to the pawl 21, said spring tending to keep the pawl 21 in engagement with the flange 24 of the drum. Secured to the pawl 21 is the pin 28, on which is mounted the cen-



trifugal pawl 29. Secured to the lug 30 of the lever 16 is the spring 31, which is also secured to the centrifugal pawl 29 and tends to hold the said centrifugal pawl against the lug 27.

33 is a bolt which is adapted to engage the end of the lever 16 when pressed inwardly, but which is normally held out of engagement by the spring 34.

The operation of the device is as follows:

When the parts are in their normal position, they are as represented in Figs. 1 and 2. The centrifugal pawl 29 is held against its banking 27, the pawl 21 engages the tooth 23 of the drum, and the spring 18 is under strain or tension, tending to rotate the drum 11 and the lever 16 in opposite directions, thus tending to rotate the drum to the right, as seen in Fig. 1, to wind up the trolley-rope 12 and tending to rotate the lever 16 to the left. This relative rotation of these two members is prevented by the engagement of the pawl 21 with the tooth 23 of the drum, and, as is evident, the drum and lever, together with the spring 18 and the pawls 21 and 29, rotate together as though made of one piece. The spring 13 acts at all times to wind up the trolley-rope, and it is made of just sufficient strength to prevent slack or looseness in the trolley-rope as the trolley-wheel rises and falls due to the varying distance of the trolley-wheel from the car. When, however, the trolley-wheel has from any cause left the trolley-wire, it starts upward with a rapid increase of speed, which is of course transmitted to the drum 11. The sudden jerk and the increased centrifugal force acting upon the pawl 29 overcomes the tension of the spring 31 and permits the pawl 29 to swing outward and engage one of the teeth 3 of the internal ratchet formed in the support 1. This position of the pawl 29 is illustrated by the full lines in Fig. 3. The continued movement of the lever 16 when the pawl 29 is in engagement with a tooth 3 throws the pawl 21 out of engagement with the tooth on the drum and into engagement with a tooth 3 of the stationary support, which brings the spring 18 into action and causes the trolley-rope to be wound up on the drum 11, the spring 18 being made of sufficient strength to overcome the upward pull of the trolley-pole when the trolley has left the trolley-wire. The position of the lever 16 and the pawls 21 and 29 when this has occurred is shown in dotted lines in Fig. 3. The trolley pole and wheel are thus pulled down clear of the trolley-wire and its supporting structure, thereby preventing the damage which would be likely to occur if the trolley-pole were allowed to strike the overhead structure. To return the trolley to the wire, the trolley-rope is pulled down a short distance, which allows the pawls 21 and 29 to return to their normal position, the pawl 21 resting anywhere on the flange 24 and the pawl 29 returning to its banking 27. The trolley-rope may then be withdrawn

from the trolley-catcher against the action of the light spring 13 and the trolley replaced on the wire in the usual manner. In this condition the car may be at once started or continued in motion without loss of time. To again set the stiff spring 18, the bolt 33 is pressed in and the trolley-rope is pulled out. The drum 11 and lever 16 will then revolve together until the lever 16 engages the bolt 33, when the further withdrawal of the rope will wind up or place under strain the spring 18, the pawl 21 dropping into engagement with the tooth 23, leaving all of the parts in their normal position, as they were originally. The tension of the spring 13 is readily adjusted by turning the spring-key 9 outwardly, when the shaft 8 is no longer locked and may be turned to increase or decrease the tension of said spring. It is thus seen that in this mechanism the drum is at all times under the action of a relatively weak spring, tending to wind up the trolley-rope, and that there is, when the mechanism is in its normal condition, connected to this drum a relatively strong spring, which is normally in a strained condition, one end of said spring being attached to the drum and the other to a rotatable member, which is clutched to the drum in such a way that the relatively strong spring has no influence whatever on the motion of the drum, and when by a sudden jerk or increase of the speed of rotation of the drum the rotatable member to which the strong spring is attached is released from the drum and clutched to the stationary support the drum is then under the action of the relatively strong spring, tending to wind up the trolley-rope.

Having thus described my invention, what I claim is—

1. In a trolley-catcher, the combination with a drum, of a lever pivoted concentrically with said drum, a spring acting to cause said drum to rotate relatively to said lever, a pawl mounted on said lever adapted to engage said drum, to cause the drum and lever to rotate together, and means for automatically disengaging said pawl.

2. In a trolley-catcher, the combination with a drum, of a lever mounted concentrically with said drum, a spring engaging said drum and said lever tending to rotate them in opposite directions, a clutch connecting said drum and said lever, and means for automatically disengaging said clutch.

3. In a trolley-catcher, the combination with a drum, of a lever concentrically mounted with said drum, a spring engaging said drum and said lever to cause them to rotate in opposite directions, means for clutching said drum and said lever together against the action of said spring.

4. In a trolley-catcher, the combination with a rotary drum, of a lever mounted concentrically with said drum, a spring engaging said drum and said lever tending to cause them to rotate in opposite directions, means



for clutching said drum and said lever together against the action of said spring, and means for automatically unclutching said lever from said drum and clutching it to a stationary member.

5. In a trolley-catcher, the combination with a drum, and rotatable member, mounted concentrically, of a spring engaging said drum and said rotatable member tending to rotate them in opposite directions, a clutch connecting said drum and said rotatable member, and means for automatically disengaging said clutch and holding said rotatable member against rotation.

6. In a trolley-catcher, the combination with a stationary support, of a drum and a rotatable member concentrically mounted, a spring engaging said drum and said rotatable member tending to rotate them in opposite directions, a clutch mounted on said rotatable member engaging either said drum or said stationary support, the engagement with the one causing the disengagement of the other.

7. In a trolley-catcher, the combination with a stationary support, of a shaft mounted in said support, a drum mounted on said shaft, a lever mounted on the hub of said drum, a spring connecting said lever with said drum, a pawl pivotally mounted on said lever normally engaging said drum, and means for automatically disengaging said pawl from said drum, and engaging it with said stationary support.

8. In a trolley-catcher, the combination with a stationary support of a drum mounted in said support, a rotatable member mounted concentrically with said drum, a spring connecting said drum and said rotatable member tending to rotate them in opposite directions, a pawl pivotally mounted on said rotatable member, normally engaging said drum, a centrifugally-controlled pawl pivotally mounted on said pawl, adapted by its engagement with said stationary support to disengage said pawl from said rotatable member and engage it with said stationary support.

9. In a trolley-catcher, the combination with a fixed support, of a drum, a spring normally under strain, having its one end in fixed, and its other end in releasable, engagement with said drum, and means whereby the releasable end of said spring is released from said drum and held by said fixed support to

cause said drum to rotate under the action of said spring.

10. In a trolley-catcher, the combination with a stationary support, of a shaft mounted in said support, a drum mounted on said shaft, a spiral spring secured at its one end to said drum and at its other end to said shaft, and means for turning and locking in position said shaft to adjust the strain of said spiral spring.

11. In a trolley-catcher, the combination with a stationary support, of a shaft mounted in said support, a drum revolvably mounted on said shaft, a relatively strong spring normally under strain, adapted to be automatically released to rotate said drum and a relatively weak spiral spring having its outer end secured to said drum and its inner end secured to said shaft.

12. In a trolley-catcher, the combination with a stationary support, of a shaft mounted in said support, a drum revolvably mounted on said shaft, a relatively strong spring normally under strain, adapted to be automatically released to rotate said drum, a relatively weak spiral spring, having its outer end secured to said drum and its inner end secured to said shaft and means for turning and locking said shaft to adjust said relatively weak spring.

13. In a trolley-catcher, the combination with a stationary support, of a drum mounted in said support, a rotatable member mounted concentrically with said drum, a spring secured to said drum and said rotatable member tending to rotate them in opposite directions, a pawl mounted on said rotatable member, a spring acting on said pawl tending to hold it in engagement with said drum, a centrifugally-actuated pawl pivotally mounted on said first-named pawl, a ratchet on said stationary support, adapted to be engaged by said centrifugally-actuated pawl to release said first-named pawl from said drum and throw it into engagement with said stationary support.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES I. EARLL.

Witnesses:

C. F. CARRINGTON,  
EDW. B. HAWKINS.